# Probability Theory

## and Related Fields

Continuation of
Zeitschrift für Wahrscheinlichkeitstheorie

Volume 101 1995

**Managing Editor**

**E. Bolthausen** — Editorial Office of PTRF, Institute of Applied Mathematics, University of Zürich, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland

**Honorary Editors**

**K.L. Chung,** Stanford
**K. Krickeberg,** Paris
**L. Schmetterer,** Wien

**Editorial Board**

**M.T. Barlow**
Department of Mathematics
University of British Columbia
Vancouver
B.C., Canada V6T 1Y4

**M. Bramson**
Mathematics Department
University of
Wisconsin-Madison
480 Lincoln Drive
Madison, WI 53706, USA

**F. Götze**
Faculty of Mathematics
University of Bielefeld
Universitätsstrasse
D-33615 Bielefeld, Germany

**G.R. Grimmett**
Statistical Laboratory
University of Cambridge
16 Mill Lane
Cambridge CB2 1SB, UK

**P.G. Hall**
Department of Statistics
Faculty of Economics
A.N.U., G.O.P. Box 4
Canberra, ACT 2601, Australia

**J. Jacod**
Université Paris VI
Laboratoire de Probabilités
Tour 56
4 Place Jussieu
F-75230 Paris Cedex 05
France

**T.J. Lyons**
Imperial College
Department of Mathematics
Huxley Building
180 Queens Gate
London SW7 2B7, UK

**D. Nualart**
Department of Statistics
Faculty of Mathematics
University of Barcelona
Gran Via de les Cortes
Catalanes 585
E-08007 Barcelona
Spain

**T.S. Salisbury**
Department of Mathematics
York University
North York, Ontario
Canada M3J 1P3

**A.-S. Sznitman**
Mathematik Departement
ETH-Zentrum
CH-8092 Zürich,
Switzerland

**M. Talagrand**
Equipe d'Analyse
Université Paris VI
4, Place Jussieu,
F-75230 Paris Cedex 05
France

**H.T. Yau**
Courant Institute of
Mathematical Sciences
New York University
251 Mercer Street
New York, NY 10012, USA

**Advisory Board**

**D. Brydges,** Charlottesville
**K. Burdzy,** Seattle
**J.-D. Deuschel,** Berlin
**M. Emery,** Strasbourg
**M. Fukushima,** Osaka
**H.-O. Georgii,** Munich
**O. Kallenberg,** Auburn
**H. Kaspi,** Haifa
**F. Papangelou,** Manchester
**E. Perkins,** Vancouver

Springer

**"Probability Theory and Related Fields"** was founded in 1962. The original title was **"Zeitschrift für Wahrscheinlichkeitstheorie und verwandte Gebiete."** As of Volume 51, 1980, the subtitle *Probability Theory and Stochastics* was added. Beginning with Volume 71, 1986, the main title was adapted into English.
The first Managing Editor was L. Schmetterer, who was succeeded by K. Krickeberg in 1971, by H. Rost in 1985, O. Kallenberg in 1991 and by E. Bolthausen in 1994.

**Copyright**
Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.
*While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.*

*Special regulations for photocopies in the USA.* Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of U.S. Copyright Law, provided a fee is paid. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0044-3719, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

The Canada Institute for Scientific and Technical Information (CISTI) provides a comprehensive, world-wide document delivery service for all Springer-Verlag journals. For more information, or to place an order for a copyright-cleared Springer-Verlag document, please contact Client Assistant, Document Delivery, Canada Institute for Scientific and Technical Information, Ottawa K1A 0S2, Canada (Tel: 6 13-9 93-92 51; Fax: 6 13-9 52-82 43; e-mail: cisti.docdel@nrc.ca).

Springer-Verlag Berlin Heidelberg New York Tokyo

Printers: Saladruck GmbH & Co. KG, Berlin

© Springer-Verlag Berlin Heidelberg 1995

Springer-Verlag GmbH & Co. KG, Berlin

Printed in Germany

# *Contents*


Arnold, L., Scheutzow M.: Perfect cocycles through stochastic differential equations 65

Barden, D. → Le, H.
Bass, R.F., Burdzy, K.: Conditioned Brownian motion in planar domains 479
Bovier, A., Gayrard, V., Picco, P.: Large deviation principles for the Hopfield model and the Kac-Hopfield model 511
Burdzy, K. → Bass, R.F.

Chen, Z.Q., Williams, R.J., Zhao, Z.: On the existence of positive solutions for semilinear elliptic equations with Neumann boundary conditions 251
Chernov, N.I.: Limit theorems and Markov approximations for chaotic dynamical systems 321

Doney, R.A. : Spitzer's condition and ladder variables in random walks 577

Gayrard, V. → Bovier, A.
Graham, C.: Homogenization and propagation of chaos to a nonlinear diffusion with sticky reflection 291
Gyöngy, I., Nualart, D., Sanz-Sole, M.: Approximation and support theorems in modulus spaces 495

Häggström, O.: On the relation between finite range potentials and subshifts of finite type 469

Janssen, A.: Principal component decomposition of non-parametric tests 193
Jaworski, W.: On the asymptotic and invariant $\sigma$-algebras of random walks on locally compact groups 147

Kesten, H., Schonmann, R.H.: On some growth models with a small parameter 435
Krebs, W.B.: Brownian motion on the continuum tree 421
Kwon, Y.: Reflected Brownian motion in a cone: Semimartingale property 211

Laroche, E.: Hypercontractivité pour des systèmes de spins de portée infinie 89
Le, H., Barden, D.: Itô correction terms for the radial parts of semimartingales on manifolds 133
Léonard, C.: On large deviations for particle systems associated with spatially homogeneous Boltzmann type equations 1

Malric, M.: Transformation de Lévy et zéros du mouvement Brownien 227
Meyre, T., Werner, W.: On the occupation times of cones by Brownian motion 409
Miamee, A.G., Schröder, B.S.W.: On completeness of the spectral domain of harmonizable processes 303
Monrad, D., Rootzén, H.: Small values of Gaussian processes and functional laws of the iterated logarithm 173

Nualart, D. → Gyöngy, I.

Osada, H., Saitoh, T.: An invariance principle for non-symmetric Markov processes and reflecting diffusions in random domains 45

Picco, P. → Bovier, A.
Porod, U.: $L_2$-lower bounds for a special class of random walks 277

Rootzén, H. → Monrad, D.
Ramachandran, D., Rüschendorf, L.: A general duality theorem for marginal problems 311
Rüschendorf, L. → Ramachandran, D.

Saitoh, T. → Osada, H.
Sanz-Sole, M. → Gyöngy, I.
Scheutzow, M. → Arnold, M.
Schonmann, H. → Kesten, H.
Schröder, B.S.W. → Miamee, A.G.
Seppäläinen, T.: Maximum entropy principles for disordered spins 547
Serlet, L.: Some dimension results for super-Brownian motion 371

Vondraček, Z.: Some Markov processes with Brownian exit distributions 393

Wang, F.-Y.: Estimates of the first Dirichlet eigenvalue by using diffusion processes 363
Werner, W. → Meyre, T.
Williams, R.J. → Chen, Z.Q.

Zhao, Z. → Chen, Z.Q.
Zheng, W.: A large deviation result for a class of Dirichlet processes 237



Covered by *Zentralblatt für Mathematik* and *Current Mathematical Publications*